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BOT 6516 PLANT METABOLISM

Fatty Acid Biosynthesis

What does lipid mean?

What makes plant lipid metabolism so complex?

How many fatty acids in plants?

“Cellular compartmentation depends on polar lipids.” What does this mean?

What type of lipid is bountiful in chloroplasts and why?

What is a triacylglycerol?

Define waxes.

Overall, what are general functions of lipids in plants?

What are the common fatty acids found in plants?

What are the four principal types of glycerolipids in plants?

What advantages do triacylglycerols have over other forms of reduced carbon as a storage molecule?

Amphipathic, what is that?

What is the biochemical basis for 16:3 and 18:3 plants?

Where are sphingolipids predominately found in the plant cell?

Why is it that plant fatty acid biosynthesis is so similar to that of bacteria?

What are ACCase and FAS?

Can you describe the “core reactions” of fatty acid synthesis? Do you know what is happening in these reactions?

Here is a simple statement: to synthesize a fatty acid is expensive. Why and how so?

In general, what compound is the precursor of fatty acid biosynthesis?

Hold on, where is pyruvate dehydrogenase found in plant cells? What did you say?

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What reaction does acetyl-CoA synthetase catalyze?

Are there transporters in plants for acetyl-CoA? For acetate?

What does it mean homodimeric and heteromeric ACCase?

Where is ACCase located? What are the metabolic implications of its localization?

What is considered the first committed step of FA synthesis?

Is the concentration of malonyl-CoA light regulated?

Is ACCase regulated in any way?

What is the difference between type II and type I FAS?

What is ACP?

What is substrate channeling?

What vitamin required by humans is the precursor of the prosthetic group of ACP?

There is a small error in Reaction 10.2 (page 472) but is correctly shown in Fig. 10.14.

Do KAS I and II have different substrate specificities? What about KAS III?

Does KAS III alter longstanding dogma?

Can you describe the Claisen condensation reaction in everyday terms that makes this part of FA synthesis understandable?

How is synthesis of a FA terminated?

How are free fatty acids transported around the cell?

Here is something for the diet doctors to seize upon, salads have FatA and FatB in them, heaven forbid. Why doesn't this both you?

What is special about stearoyl-ACP Δ^9 -desaturase of plants? What are its substrates?

What type of reaction does this desaturase resemble?

Check out Fig. 10.20 for the reaction mechanism and the flow of electrons.

Why has studying desaturation in plants been so difficult?

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What is the source of electrons for ER-localized desaturases?

How is the saturation status of plant membranes regulated?

What are elongase systems doing?

What are KCSs?

Why does *Arabidopsis* have so many genes for putative KCSs?

What surprising finding has come from looking at enzymes that lead to the synthesis of unusual lipids derived from common fatty acids precursors?

What conclusion can be drawn from the occurrence or distribution of unusual fatty acids across taxonomic boundaries?